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(54) Title: FOOD PRODUCT AND PROCESS FOR MANUFACTURING SAME

(57) Abstract: This invention is concerned with packaged food products which contain specific combinations of functional additives aimed at addressing specific health indicators, in particular flatulence, gastro-intestinal health, stress and immune system responsiveness, in pet animals. There is provided a commercially packaged mammal pet food product that includes a manufactured, shelf-life stable food substrate and a combination of functional additives. The functional additives include at least one non-palatable plant-based remedy and/or dietary fibre source that are present to strengthen and/or maintain a specified health indicator of a mammal pet animal. The food product is portioned and packaged with the functional additives being present in predetermined concentrations and amounts sufficient to be effective in achieving said indications on regular feeding of the pet animal with said food product. The food substrate is present in a proportion sufficient to mask the flavour and/or odour of the non-palatable additive and is made-up of a unique combination of materials that are able to be processed at lower temperatures to preserve the natural botanical functional additive's activity. Functional additives intended to address dietary flatulence problems include a combination of Yucca extract, charcoal and salts of zinc, such as zinc acetate. Functional additives to promote or maintain gastro-intestinal health include a combination of L-glutamine, D-glucosamine sulphate, sugar beet pulp, slippery elm. Functional additives to strengthen or maintain a pet animal's natural body defenses include a combination of vitamin E, vitamin B complex, primrose oil, vitamin C and Marigold meal. Functional additives to promote or maintain reduction of stress and/or improved behavior of a pet animal include a combination of Valerian root extract, Kava root extract, vitamin B complex and magnesium salt.

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FOOD PRODUCT AND PROCESS FOR MANUFACTURING SAME**Field of the Invention**

This invention relates to packaged food products for regular feeding of
5 mammal pet animals and which contain functional additives to enhance specific
health aspects of the pet animal. The invention also relates to a process for
manufacturing a palatable pet food product containing such functional additives.

In a further aspect, the invention is concerned with packaged food
products which contain specific combinations of functional additives aimed at
10 addressing specific health indicators, in particular flatulence, in pet animals.

Background of the Invention

In the manufacture of packaged pet food products, in particular dried and
canned pet food for dogs and cats, it is known to add nutritional supplements,
such as vitamins, minerals and the like to satisfy basic dietary requirements of
15 the animal.

In the case of most vitamin and mineral supplements, the amounts mixed
into the food product to achieve general health benefits are small enough to not
adversely affect the palatability of the overall product. In essence, the food
product will be eaten by the pet animal regardless of the presence or absence
20 of such additives.

On the other hand, inclusion in the pet food product of dietary fibre
source material in amounts sufficient to achieve a "balanced" diet will often lead
to packaged products that are not readily accepted by the pet animal, due to its
reduced palatability.

25 Like other creatures, dogs, cats and other companion animals suffer
various ailments and health conditions that often require appropriate forms of
medication and/or other treatment. It is well known that medications and
remedies for companion animals can be provided in the form of tablets,
powders or liquids for oral administration. However, many pet animals are
30 reluctant to take such tablets, powders or liquids and having to force these into
the animal's mouth can be stressful for both the animal and the person
administering the medication.

The manufactured food substrate will generally include a recipe of dry ingredients and at least one liquid ingredient, which whilst commonly used in the pet food manufacturing industry have to be formulated with the taste masking capability of individual constituents in mind, as well as to maintain the functionality of the additives. The water content of the finished product will
5 largely depend on whether the product is a "dry", biscuit-style treat or a "meaty chew" bar or bite food product.

In accordance with the invention there is provided a unique combination of materials that make up the food substrate, in that the materials are able to
10 be properly processed at lower temperatures to preserve the natural botanical functional additive's activity. Sugar-based compounds (e.g. combinations of sugar and/or glucose, and/or dextrose, and/or maltodextrines) provide preservation and textural variation.

Compounds that are suited to adequately mask unpalatable (odour and/or taste) functional additives include dry food substrate ingredients based
15 on animal proteins and carbohydrates. To these is generally added an anti-microbial agent. The animal protein will generally constitute from about 17% to 50% by weight of the dry ingredients and serve as the main flavouring agent of the food product to mask the functional additives, whereby the animal protein
20 will usually be derived from beef, pork, mutton, poultry, fish or a combination of these. The animal protein preferably includes gelatins as binding agents. The carbohydrates generally include simple and complex carbohydrates, the latter typically consisting of or including rice flour, the former generally consisting of or including glucose, glycerol and/or sugar. The antimicrobial
25 agent is preferably potassium sorbate. The at least one liquid ingredient of the pet food product is preferably water and an antioxidant, which preferably is rosemary extract.

The water may constitute in a finished biscuit-style product less than 5% by weight, and from as little as about 10 to about 20% by weight where the
30 finished food product is a palatable, 'treat'-sized, chewy tablet. The latter has a base consisting mainly of cooked, pulverized animal meats and bones which have been compression-moulded into a portion-shape.

A palatable pet food product in the form of a palatable, 'treat'-sized, chewy tablet, may typically include ingredients in the following proportions by weight of finished product:

- gelatine – from about 3 to about 7%;
- 5 • glucose – from about 2 to about 5%;
- sugar – from about 2 to about 5%;
- glycerol – from about 1 to about 4%;
- potassium sorbate – from about 0.2 to about 0.5%;
- rosemary extract – from about 0.01 to about 0.05%;
- 10 • water – from about 10 to about 20%; and
- the balance being composed of pulverised meat (approx 50%), cereal flour (approx 11%), sugar (approx 8%), glycerine (approx 9%), citric acid (approx 1%) and preservatives (approx 0.1%).

The pet food product described above may be provided in any suitable
15 shape, so as to facilitate administration to a pet animal of a desired amount of the product corresponding with a desired dosage. Accordingly, the pet food product may be provided in the form of single biscuits, in which case each biscuit contains a substantially identical, predetermined dosage of the functional additives. Alternatively, the pet food product may be provided as a
20 food bar, in which case the food bar has substantially uniform concentration of the at least one functional additive throughout the length of the bar. The food bar may then include markings, etchings or the like for indicating where the bar may be broken so as to provide the pet animal with the desired dosage of the functional additives.

25 In a manufacturing process aspect of the invention there is provided a process for manufacturing a palatable, treat-style pet food product using dry and liquid ingredients and functional additives, of the type described above, including the steps of:

- mixing the dry ingredients which include animal protein, carbohydrates and
30 an antimicrobial agent;
- heating the dry ingredient mixture to between 50 to 80°C, preferably about 60°C, for about 5 to 15 minutes, preferably about 10 minutes;

- adding the functional additives to the dry ingredient mixture;
- mixing the resultant mixture for about 5 minutes;
- heating, in a separate container, liquid ingredients, including water and an antioxidant, to between 60 to 85°C, preferably about 75°C;
- 5 • adding the heated liquid ingredients to the resultant mixture to obtain a moistened mixture;
- heating the moistened mixture to between 60 to 80°C, preferably about 75°C, for about 5 minutes to obtain a cooked mixture;
- substantially immediately after the heating step subjecting the cooked
- 10 mixture to a cooling step to achieve a processed mixture temperature of between 40 to 60°C, preferably about 50°C; and
- moulding the cooled processed mixture by impression moulding or cutting techniques so as to form a packagable product of predetermined treat size, shape and weight.

15 In case of a divisible pet food product, the process may further include the step of making markings, etchings or the like on the moulded product so as to enable the packaged product, in use, to be easily broken into pieces of a particular size.

It has also been discovered that the above referenced combination of

20 Yucca Shidigera extract, vegetable charcoal and zinc acetate, when mixed into a carrier suitable for human consumption, will also have positive effects with regards to flatulence problems perceived by humans. One way of ensuring easy administrability of these functional additives to e.g. children is to mix these constituents into a conventional short biscuit recipe. The short

25 biscuit recipe may includes, in weight-% of non-water or milk components, 31% butter or shortening, 17% icing sugar, 39% biscuit flour, vegetable charcoal from about 10 to 12%, Yucca extract from about 0.07 to 0.12% and zinc acetate from about 0.5 to 0.8%, bearing in mind that the RDA of zinc is about 15mg in accordance with the European Union Nutrition labelling

30 Directive.

Other aspects of the invention will become apparent from the following description of tests carried out to show the health-benefits that are obtainable

CLAIMS:

1. A packaged, treat-size, mammal pet food product, including:
 - a manufactured food substrate; and
 - 5 • a combination of functional additives, of which at least one is a non-palatable plant extract and/or dietary fibre source that are present to strengthen and/or maintain a specified health indicator of a mammal pet animal, wherein the food product is portioned and packaged with at least one functional additive being present in a pre-determined concentration and
 - 10 amount sufficient to be effective in achieving said indicator on regular feeding of the pet animal with said food product, and wherein said food substrate is present in a proportion sufficient to mask the flavour and/or odor non-palatable additives.
- 15 2. A packaged pet food product according to claim 1, wherein the functional additives include L-glutamine, D-glucosamine sulphate, sugar beet pulp, slippery elm and as an optional additive inulin, said functional additives being present in amounts sufficient to promote or maintain gastro-intestinal health when the pet food product is ingested by a pet animal on a regular,
- 20 preferably daily basis.
3. A packaged pet food product according to claim 2, wherein the functional additives are provided in the following amounts, by weight of finished product, the balance being made-up by the manufactured food
- 25 substrate and other nutritional supplements:
 - L-glutamine – from about 3 to about 5%;
 - D-glucosamine sulphate – from about 3 to about 5%;
 - sugar beet pulp – from about 4 to about 8%;
 - inulin, if present – from about 3.0 to about 4.5%; and
 - 30 • slippery elm – from about 1.5 to about 2.5%.

4. A packaged pet food product according to claim 3, wherein the functional additives are provided in the following amounts: L-glutamine – about 4%, D-glucosamine sulphate – about 4%, sugar beet pulp – about 6, slippery elm – about 2%.

5

5. A packaged pet food product according to claim 1, wherein the functional additives include a combination of vitamin E, vitamin B complex, evening primrose oil, vitamin C and marigold meal, said functional additives being present in amounts sufficient to strengthen or maintain a pet animal's natural body defences (immune system function) when the pet food product is provided to the pet animal on a regular, preferably daily basis.

6. A packaged pet food product according to claim 5, wherein the functional additives are provided in the following amounts, by weight of finished product, the balance being made up by the manufactured food substrate and other nutritional supplements;

- vitamin E – about 1.0 to about 2.5%;
- vitamin B complex – about 0.10 to about 0.25%;
- evening primrose oil – about 0.7 to about 2.5%;
- vitamin C – about 0.5 to about 3.0%;
- marigold meal – about 0.4 to about 0.8%.

7. A packaged pet food product according to 6, wherein the functional additives are provided in the following amounts: vitamin E – about 2%, vitamin B complex – about 0.2%, evening primrose oil – about 0.8%, vitamin C – about 2.5% and marigold meal – about 0.6.

8. A packaged pet food product according to claim 1, wherein the functional additives include Valerian root extract, Kava root extract, vitamin B complex and a magnesium salt, said functional additives being present in amounts sufficient to promote or calmness and/or improved behaviour of a pet

animal when the pet food product is provided to the pet animal on a regular, preferably daily basis.

9. A packaged pet food product according to claim 8, wherein in addition
5 to or in partial substitution for Valerian root extract and/or Kava root extract, Ginkgo Bilboa extract and St John's Wort extract is present in physiological relevant amounts.

10. A packaged pet food product according to claim 8 or 9, wherein the
10 functional ingredients are provided in the following amounts, by weight of finished product, the balance being made-up by the manufactured food substrate and other nutritional supplements;

- Valerian root extract – from about 0.3 to about 1.0%;
- Kava root extract – from about 0.3 to about 3%;
- 15 • if present, Ginkgo Biloba extract – from about 0.1 to about 1.0%;
- if present, St John's Wort extract – from about 0.1 to about 1.0%;
- vitamin B complex – from about 0.5 to about 3.0%; and
- magnesium salt – from about 0.5 to about 2.5%.

20 11. A packaged pet food product according to claim 10, wherein the functional additives are provided in the following amounts:

- Valerian root extract –about 0.4%;
- Kava root extract – about 2%;
- vitamin B complex –about 2.5%;
- 25 • magnesium sulphate—about 1.8%.

12. A packaged pet food product claim 1, wherein the functional additives
include two or more additives selected from the group consisting of Yucca
extract, vegetable charcoal and salts of zinc acetate, said functional additives
30 being present in amounts sufficient to reduce flatulence odour when the pet food product is provided to a pet animal on a regular, preferably daily basis.

13. A packaged pet food product according to claim 12, wherein the functional additives are provided in the following amounts, by weight of finished product, the balance being made-up by the manufactured food substrate and other nutritional supplements:

- 5
- Yucca Shidigera or Elata extract – from about 0.05 to about 0.11%, preferably 0.06%;
 - Vegetable charcoal – from about 6 to about 14%, preferably 6%; and
 - zinc acetate – from about 0.3 to about 0.8%, preferably 0.4%.

10 14. A packaged pet food product according to claim 3, 6, 10 or 13, wherein the food substrate includes dry ingredients comprising animal protein, carbohydrates and an anti-microbial agent, and at least one liquid ingredient in a predetermined ratio to the sum of the dry ingredients.

15 15. A packaged pet food product according to claim 4, 7 or 11, wherein the food substrate includes dry ingredients comprising animal protein, carbohydrates and an anti-microbial agent, and at least one liquid ingredient in a predetermined ratio to the sum of the dry ingredients

20 16. A packaged pet food product according to claim 14 or 15, wherein the animal protein constitutes from about 17% to 50% by weight of the dry ingredients.

25 17. A packaged pet food product according to claim 16, wherein the animal protein is derived from beef, pork, mutton, poultry, fish or a combination of these.

18. A packaged pet food product according to claim 17, wherein the animal protein includes gelatins.

30

19. A packaged pet food product according to claim 14, 15, 17 or 18, wherein the carbohydrates include simple and complex carbohydrates.

19. A packaged pet food product according to claim 14, 15, 17 or 18, wherein the carbohydrates include simple and complex carbohydrates. wherein the complex carbohydrates include rice flour, and wherein the simple carbohydrates include glucose, glycerol and/or sugar.

5

20. A packaged pet food product claim 14, 15, 17 or 18, wherein the antioxidant is rosemary extract.

21. A packaged pet food product according to claim 14 or 15, wherein the
10 water constitutes about 10 to about 20% by weight of the finished product.

22. A packaged pet food product in accordance with claim 16, in the form of a palatable, 'treat'-sized, chewy tablet, including the following ingredients in proportions by weight of finished product:

- 15
- gelatine – from about 3 to about 7%;
 - glucose – from about 2 to about 5%;
 - sugar – from about 2 to about 5%;
 - glycerol – from about 1 to about 4%;
 - potassium sorbate – from about 0.2 to about 0.5%;

20

 - rosemary extract – from about 0.01 to about 0.05%,
 - water – from about 10 to about 20%; and
 - the balance being composed of pulverised meat (approx 50%), cereal flour (approx 11%), sugar (approx 8%), glycerine (approx 9%), citric acid (approx 1%) and preservatives (approx 0.1%).

25

23. A packaged pet food product according to claim 22, wherein the product is provided in the form of a biscuit or multi-piece biscuit that is easily divisible so as to facilitate administration to a pet animal of a desired amount of the product corresponding with a desired dosage of the functional additives.

30

24. A packaged pet food product according to claim 22, wherein the product is provided in the form of a food bar, having substantially uniform

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